

## CLAIMS:

1. A device for deagglomerating powder agglomerates for inhalation, comprising:

a body having a chamber adapted for fluid circulation therethrough;

5 an inlet connected to the chamber and to a powder source for supplying the chamber with powder agglomerates entrained in a flow of gas, the powder agglomerates and the flow of gas defining a swirling fluid flow inside the chamber, the powder agglomerates being subjected to at least one of turbulence, shear force fluidizing, collisions with other ones of the powder agglomerates, and  
10 collisions with a surface of the chamber;

an outlet connected to the chamber for inhalation such that the swirling fluid flow in the chamber can exit from the chamber as a longitudinal fluid flow and secondary fluid flow, the longitudinal fluid flow being directed along a longitudinal axis of the outlet, and the secondary fluid flow being directed away from the  
15 longitudinal axis of the outlet; and

a mesh in the outlet for preventing powder agglomerates above a predetermined size from traversing the mesh, and for reducing the secondary fluid flow relative to the longitudinal fluid flow exiting from the chamber to thereby reduce powder deposition in a mouth and throat of a user.

20 2. The device according to claim 1, wherein the mesh is positioned near a base of the outlet that is adjacent to the surface of the chamber so that most of the powder agglomerates in the chamber collide with the mesh at an oblique angle to assist in deagglomerating of the powder agglomerates inside the chamber.

25 3. The device according to claim 1, wherein the chamber is a cyclone chamber having a disc-shaped portion, the inlet having a longitudinal axis that is perpendicular with respect to the longitudinal axis of the outlet, the longitudinal axis of the inlet being offset from the longitudinal axis of the outlet so that an inner  
30 surface at a base of the inlet is tangential with respect to the surface of the chamber.

4. The device according to claim 2, wherein the mesh has a pore size of less than 250  $\mu\text{m}$ .

5. The device according to claim 4, wherein the pore size of the mesh ranges between 30 to 150  $\mu\text{m}$ .

6. The device according to claim 2, wherein the inlet has an internal diameter of 5 to 7 mm and the outlet has an internal diameter of 8 to 12 mm.

10 7. The device according to claim 1, further comprising a mouthpiece having a first end being connectable to the outlet and a second end being insertable in the mouth of the user.

15 8. The device according to claim 7, wherein the mesh is connected to the first end of the mouthpiece.

9. The device according to claim 7, wherein the mouthpiece includes a straight diffuser with a 13 to 15 degrees deflection, and has an internal diameter of 15 to 25 mm and a length of 5 to 25 mm.

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10. A method for deagglomerating powder agglomerates for inhalation, comprising the steps of:

a) providing a body having a chamber adapted for fluid circulation therethrough;

25 b) supplying the chamber with powder agglomerates entrained in a flow of gas via an inlet connected to the chamber and to a powder source, the powder agglomerates and the flow of gas defining a swirling fluid flow inside the chamber, the powder agglomerates being subjected to at least one of turbulence, shear force fluidizing, collisions with other ones of the powder agglomerates, and  
30 collisions with a surface of the chamber;

c) connecting an outlet to the chamber for inhalation such that the swirling fluid flow in the chamber can exit from the chamber as a longitudinal fluid flow and

secondary fluid flow, the longitudinal fluid flow being directed along a longitudinal axis of the outlet, and the secondary fluid flow being directed away from the longitudinal axis of the outlet; and

d) positioning a mesh in the outlet for preventing powder agglomerates above a predetermined size from traversing the mesh, and for reducing the secondary fluid flow relative to the longitudinal fluid flow exiting from the chamber to thereby reduce powder deposition in a mouth and throat of a user.

11. The method according to claim 10, wherein step d) comprises the step of positioning the mesh near a base of the outlet that is adjacent to the surface of the chamber so that most of the powder agglomerates in the chamber collide with the mesh at an oblique angle to assist in deagglomerating of the powder agglomerates inside the chamber.

12. The method according to claim 1, wherein step a) the chamber is a cyclone chamber having a disc-shaped portion, the inlet having a longitudinal axis that is perpendicular with respect to the longitudinal axis of the outlet, the longitudinal axis of the inlet being offset from the longitudinal axis of the outlet so that an inner surface at a base of the inlet is tangential with respect to the surface of the chamber.

13. The method according to claim 11, wherein step d) the mesh has a pore size of less than 250  $\mu\text{m}$ .

14. The method according to claim 13, wherein step d) the pore size of the mesh ranges between 30 to 150  $\mu\text{m}$ .

15. The method according to claim 11, wherein in step b) the inlet has an internal diameter of 5 to 7 mm and in step c) the outlet has an internal diameter of 8 to 12 mm.

16. The method according to claim 10, further comprising the step of e) providing a mouthpiece having a first end being connectable to the outlet and a second end being insertable in the mouth of the user.

5 17. The method according to claim 16, wherein step e) the mesh is connected to the first end of the mouthpiece.

18. The method according to claim 16, wherein step e) the mouthpiece includes a straight diffuser with a 13 to 15 degrees deflection, and has an internal diameter  
10 of 15 to 25 mm and a length of 5 to 25 mm.